REMARKS

Claims 1-78 remain in the application for consideration. In view of the following remarks, Applicant respectfully requests that the application be forwarded on to issuance.

§ 103 Rejections

Claims 1-78 stand rejected under U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,038,378 to Kita et al. (hereinafter "Kita").

Before undertaking a discussion regarding the substance of the Office's rejections, the following discussion of the § 103 Standard is provided.

The § 103 Standard

To establish a prima facie case of obviousness, ***three basic criteria must be met***. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992); *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988). Second, there must be a reasonable expectation of success. *In re Merck & Co., Inc.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). ***The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in applicant's disclosure***. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1439 (Fed. Cir. 1991).

Hence, when patentability turns on the question of obviousness, the search for and analysis of the prior art includes evidence relevant to the finding of whether there is a teaching, motivation, or suggestion to select and combine the references relied on as evidence of obviousness. See, e.g., *McGinley v. Franklin Sports, Inc.*, 262 F.3d 1339, 1351-52, 60 USPQ2d 1001, 1008 (Fed. Cir. 2001) ("the central question is whether there is reason to combine [the] references," a question of fact drawing on the Graham factors). The mere fact that references *can* be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. *In re Mills*, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990). "To support the conclusion that the claimed invention is directed to obvious subject matter, either the references must expressly or impliedly suggest the claimed invention or ***the examiner must present a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references***." *Ex parte Clapp*, 227 USPQ 972, 973 (Bd.Pat. App. & Inter. 1985)(emphais added).

"The factual inquiry whether to combine references must be thorough and searching." *Id.* It must be based on objective evidence of record. This precedent has been reinforced in myriad decisions, and cannot be dispensed with. See, e.g., *Brown & Williamson Tobacco Corp. v. Philip Morris Inc.*, 229 F.3d 1120, 1124-25, 56 USPQ2d 1456, 1459 (Fed. Cir. 2000) ("a showing of a suggestion, teaching, or motivation to combine the prior art references is an 'essential component of an obviousness holding'") (quoting *C.R. Bard, Inc., v. M3 Systems, Inc.*, 157 F.3d 1340, 1352, 48 USPQ2d 1225, 1232 (Fed. Cir. 1998)); *In re Dembiczak*, 175 F.3d 994, 999, 50 USPQ2d 1614, 1617 (Fed. Cir. 1999) ("Our

case law makes clear that the best defense against the subtle but powerful attraction of a hindsight-based obviousness analysis is rigorous application of the requirement for a showing of the teaching or motivation to combine prior art references."); *In re Dance*, 160 F.3d 1339, 1343, 48 USPQ2d 1635, 1637 (Fed. Cir. 1998) (there must be some motivation, suggestion, or teaching of the desirability of making the specific combination that was made by the applicant); *In re Fine*, 837 F.2d 1071, 1075, 5 USPQ2d 1596, 1600 (Fed. Cir. 1988) ("'teachings of references can be combined only if there is some suggestion or incentive to do so.'") (emphasis in original) (quoting *ACS Hosp. Sys., Inc. v. Montefiore Hosp.*, 732 F.2d 1572, 1577, 221 USPQ 929, 933 (Fed. Cir. 1984)); *In re Fritch,* 23 USPQ2d 1780, 1784 (Fed. Cir. 1992) ("***It is impermissible to use the claimed invention as an instruction manual or 'template' to piece together the teachings of the prior art so that the claimed invention is rendered obvious***. [O]ne cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention.") (quoting *In Re Fine*, 837 F.2d 1071, 1075, 5 USPQ2d 1596, 1600 (Fed. Cir. 1988)).

The need for specificity pervades this authority. See, e.g., *In re Kotzab*, 217 F.3d 1365, 1371, 55 USPQ2d 1313, 1317 (Fed. Cir. 2000) ***("particular findings must be made as to the reason the skilled artisan, with no knowledge of the claimed invention, would have selected these components for combination in the manner claimed").***

In view of the guidance provided above, Applicant disagrees with the Office's obviousness rejections and respectfully submits that the Office has not made out a *prima facie* case of obviousness. Accordingly, Applicant respectfully requests withdrawal of these rejections.

Claims Rejected over Kita under § 103

Claim 1 recites a method for testing software comprising:

- modeling software using a software model that describes behavior associated with the software; and
- ***operating on the software model using a random destination algorithm and at least one other different algorithm*** to produce a sequence of test actions, the random destination algorithm being configured to ***randomly select a destination*** in the model and move to that destination to produce the sequence of test actions.

In making out the rejection of this claim, the Office argues that "operating on the software model using a random destination algorithm and at least one other different algorithm to produce a sequence of test actions" is disclosed in Kita (Col 3, lines 25-35). The Office then admits that Kita does not disclose the algorithm to be a random destination algorithm. However, the Office argues that the Applicant has admitted that a random destination algorithm was well known in that art at the time of the invention. The Office then concludes that it would have been obvious to incorporate this knowledge into the teaching of Kita "because doing so provides an efficient method to test the software with various methods according to various requirement to evaluate the performance of the software thoroughly."

Applicant respectfully disagrees and submits that the Office has not established a *prima facie* case of obviousness.

Applicant agrees that Kita does not disclose the algorithm to be a random destination algorithm. Applicant disagrees with the Office's obviousness rejection and reminds the Office that the prior art reference must teach or suggest ***all the***

claim limitations. Kita does not discuss operating on a software model using a ***random destination algorithm and at least one other different algorithm,*** nor is there a ***suggestion or motivation*** or reasonable ***expectation of success*** for doing so. Instead, the cited portions of Kita describe automatically converting a program specification into an EFSM or a multiple-EFSM architecture, and automatically generating validation tests for implementations of that program specification. The validation tests are generated by traversing valid paths through the EFSM (or multiple-EFSM architecture) and coupling each of the paths with the source code of the implementation in a program shell.

The Office has not addressed the claim feature "***and at least one other different algorithm***". Applicant has reviewed Kita and submits that it neither discloses nor suggests any such feature.

Further, pages 5-10 of Applicant's application do not admit that a ***random destination algorithm*** was well known in the art, nor does the cited portion even mention ***random destination algorithm.*** Applicant respectfully suggests that the Office is mistaken and perhaps has confused "random walk" or "anti-random walk" algorithms with "***random destination***" algorithm in regards to this portion. Hence, for at least this reason, the Office has failed to establish a *prima facie* case of obviousness.

Further, the Office has failed to present a ***convincing line of reasoning*** (as required by 35 U.S.C. § 132 (see also MPEP 706.02(j)), explaining why it would have been obvious to incorporate a random destination algorithm into the teachings of Kita. To support the conclusion that the claimed invention is directed to obvious subject matter, either the references must expressly or impliedly suggest the claimed invention or the examiner must present a convincing line of

reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references. See, e.g. *Ex parte Clapp*, 227 USPQ 972, 973 (Bd. Pat. App. & Inter. 1985).

In the present case, the Office's attempt at a "convincing line of reasoning" is to state simply that "***because doing so provides an efficient method to test the software with various methods according to various requirement to evaluate the performance of the software thoroughly.***" As noted above, particular findings must be made as to the *reason* the skilled artisan, *with no knowledge of the claimed invention*, would have selected these components for combination in the manner claimed. *In re Kotzab*, 217 F.3d 1365, 1371, 55 USPQ2d 1313, 1317 (Fed. Cir. 2000).

Applicant respectfully submits that the Office has not made particular findings as to the reason the claimed subject matter would be obvious in view of the cited reference.

Additionally, and as an aside, the Office has provided a paper, available at the following link:

http://www.uspto.gov/web/menu/busmethp/busmeth103rej.htm

that describes proper and improper rejections made under §103(a). Particularly instructive is an example that appears in Section V of the paper illustrating an improper §103(a) rejection which is based upon hindsight in view of a general motivation statement. This example is reproduced below in its entirety for the Office's convenience:

V. Examples of Improper Rejection under 35 U.S.C. 103

Example 17: Improper rejection based upon hindsight - general motivation statement.

a. The claimed invention

The invention is drawn to a smart card containing a tracking mechanism, which tracks shopping preferences of consumers by recording the type, quantity, and dates of purchase for a pre-selected group of products. The smart card is useful in a system and method for introducing new and alternative products that are of the same type as products normally purchased by the shopper. The smart card records the shopper's purchases and submits an automatic notification to the shopper when a quantity threshold is achieved for the pre-selected products. This notification will encourage the consumer to consider alternative products by providing the consumer incentives, such as a pricing discount, to purchase an alternative product.

Claim 1:

A method for using a smart card in a marketing analysis program designed to introduce new products, the method comprising the steps of:

storing product information on the smart card when said products are purchased by a consumer wherein said information including type, quantity and dates of the product purchased;

identifying for each product a threshold for each of said type, quantity and dates of products purchased;

determining an incentive for an alternative product based on said threshold; and

automatically notifying said consumer when said threshold is reached for a given product identified on the smart card and providing the consumer with said incentive, whereby the incentive encourages the consumer to consider alternative products.

b. Evidence

Reference A discloses smart card that tracks consumer preferences by recording the type, quantity, and dates of purchase of pre-selected products to determine trends in consumer purchases. The smart card is periodically read by a scanner to determine its contents for market analysis. In return for using the smart card and participating in the marketing program, the user is provided with free product coupons for products that are normally purchased by the shopper.

Reference B discloses a traditional consumer incentive program that provides coupons for the purchase of named products based upon the consumer's purchase of those same products to promote customer loyalty.

c. Poor statement of the rejection

Claim 1 is rejected under 35 U.S.C. 103 as being unpatentable over Reference A in view of Reference B. Reference A discloses the conventional use of a smart card to track consumer preferences and provide incentives. However, Reference A does not disclose the automatic notification to consumer providing incentives. Reference B discloses providing incentives to consumers to purchase the desired products. ***It would have been obvious to combine Reference A's smart card with Reference B's incentive to consumers because the combination would allow Reference A's smart card to be more efficient.***

d. Analysis

The motivation, improve efficiency, is too general because it could cover almost any alteration contemplated of Reference A and ***does not address why*** this specific proposed modification would have been obvious. Additionally, there is ***nothing in either of references that would suggest*** automatically notifying the consumer when reaching a threshold nor is there anything in either reference that would suggest the notifying step. Finally, although Reference B teaches a traditional coupon scheme to promote customer loyalty, ***there is no suggestion, other than applicant's disclosure***, to employ this scheme to promote the introduction of new and alternative products. ***The rejection is improper.***

In the present rejection, the Office's statement "because doing so provides an ***efficient method"*** is similar to the Office's example of an improper rejection and does not address ***why*** this specific proposed modification would have been obvious. In the Office's own words: "[t]he motivation, improve efficiency, is too general because it could cover almost any alteration contemplated ... and ***does not address why*** this specific proposed modification would have been obvious." Therefore, the Office's rejection here is improper.

In view of the above discussion, the Office has not established a *prima facie* case of obviousness and has made an improper rejection. Hence, for at least these reasons, this claim is allowable.

Claims 2-7 depend from claim 1 and are allowable as depending from an allowable base claim. These claims are also allowable for their own recited features, which, in combination with those recited in claim 1, are neither disclosed nor suggested in the references of record, either singly or in combination with one another.

Claim 8 recites one or more computer-readable media having computer-readable instructions thereon which, when executed by a computer, cause the computer to:

- model software using a software model that describes behavior associated with the software, the software model comprising a state graph having multiple nodes individual ones of which represent a state, and links between the nodes that represent actions; and
- operate on the software model using a ***random destination algorithm and at least one other different algorithm*** to produce a sequence of test actions, the random destination algorithm being configured to randomly select a destination node in the model and move to that destination node to produce the sequence of test actions, the selection of the destination node being performed independent of any previously-traversed nodes, and independent of any nearest neighbor nodes.

In making out the rejection of this claim, the Office relies on its reasoning regarding claims 1-5. Applicant respectfully disagrees and submits that the Office has not established a *prima facie* case of obviousness.

As discussed above, Kita does not discuss operating on the software model using a ***random destination algorithm and at least one other different algorithm***,

as claimed. In addition, Applicant points out that there is no ***suggestion or motivation*** or reasonable ***expectation of success*** for doing so. Further, pages 5-10 of Applicant's application do not admit that a ***random destination algorithm*** was well known in the art, nor does the cited portion even mention ***random destination algorithm***. Finally, the Office has failed to present a ***convincing line of reasoning*** as to why it would have been obvious to incorporate a random destination algorithm into the teachings of Kita.

In view of the above discussion, the Office has not established a *prima facie* case of obviousness and has made an improper rejection. Hence, for at least these reasons, this claim is allowable.

Claim 9 recites a method of testing software comprising:

- modeling software using a software model that describes behavior associated with the software;
- operating on the software model using a ***random destination algorithm*** to produce a sequence of test actions, the random destination algorithm being configured to randomly select a destination in the model and move to that destination to produce the sequence of test actions; and
- operating on the software model using ***multiple other algorithms that are different from the random destination algorithm*** to produce a further sequence of test actions.

In making out the rejection of this claim, the Office relies on its reasoning regarding claim 1. Applicant respectfully disagrees and submits that the Office has not established a *prima facie* case of obviousness.

In view of the above discussion, the Office has not established a *prima facie* case of obviousness and has made an improper rejection. Hence, for at least these reasons, this claim is allowable.

Claims 10-15 depend from claim 9 and are allowable as depending from an allowable base claim. These claims are also allowable for their own recited features which, in combination with those recited in claim 9, are neither disclosed nor suggested in the references of record, either singly or in combination with one another.

Claim 16 recites one or more computer-readable media having computer-readable instructions thereon which, when executed by a computer, cause the computer to:

- operate on a software model using a ***random destination algorithm*** to produce a sequence of test actions, the software model comprising a state graph having multiple nodes individual ones of which represent a state, and links between the nodes that represent actions, the random destination algorithm being configured to randomly select a destination node in the state graph and move to that destination node to produce the sequence of test actions; and
- ***operate on the software model using multiple other algorithms that are different from the random destination algorithm*** to produce a further sequence of test actions, the multiple other algorithms being selected from a group comprising: a random walk algorithm, a Chinese postman algorithm, a Markov chain algorithm, and a anti-random walk algorithm.

In making out the rejection of this claim, the Office relies on its reasoning regarding claims 9-15. Applicant respectfully disagrees and submits that the Office has not established a *prima facie* case of obviousness.

The Office's reasoning in regards to claims 9-15 ultimately represent the reasoning of claims 1 and 2 combined with a single Office argument regarding claims 11-15. In its reasoning regarding claims 11-15, the Office acknowledges that Kita does not explicitly disclose a random walk algorithm, Chinese postman

algorithm, Markov chain algorithm, or anti-random walk algorithm. However, it asserts that the applicant, on pages 5-10, admits that they were well known in the art at the time the invention was made. The Office then reasons:

> Therefore, it would have been obvious to one having ordinary skill in the art to incorporate the well known knowledge into the teaching of Kita et al to have the algorithm to be one of the well known ***algorithm because doing so provides an efficient method*** to test the software with various methods according to various requirement to evaluate the performance of the software thoroughly.

This argument is essentially the same argument the Office makes in claim 1, except it refers to specific algorithms. Neither argument is valid because Kita does not disclose or suggest operating on the software model using a ***random destination algorithm***, as claimed. Additionally, the cited portions of Kita do not teach or suggest operating on the software model using ***multiple other algorithms that are different from the random destination algorithm,*** as claimed. Therefore, it is irrelevant whether or not the Applicant admits in pages 5-10 of the application that a random walk algorithm, Chinese postman algorithm, Markov chain algorithm, or anti-random walk algorithm was well known in the art. Regardless of the types of algorithms available, there is no teaching or suggestion to operate on the software model using a ***random destination algorithm,*** as claimed; or to ***operate on the software model using multiple other algorithms,*** as claimed.

Further, for the same reasons as discussed above, the Office has failed to present a ***convincing line of reasoning*** as to why it would have been obvious to incorporate a random destination algorithm or multiple other algorithms into the teachings of Kita.

In view of the above discussion, the Office has not established a *prima facie* case of obviousness and has made an improper rejection. Hence, for at least these reasons, this claim is allowable.

Claim 17 recites a method of testing software comprising:

- traversing a state graph that models software, the state graph having multiple nodes individual ones of which represent a state, and links between the nodes that represent actions, said traversing ***using an algorithm having a first graph traversal characteristic*** to produce a sequence of test actions; and
- traversing the state graph ***using an algorithm having a second graph traversal characteristic that is different from the first graph traversal characteristic*** to produce a further sequence of test actions.

In making out the rejection of this claim, the Office relies on its reasoning regarding claims 1 and 2. Applicant respectfully disagrees and submits that the Office has not established a *prima facie* case of obviousness..

Applicant is confused in regards to the applicability of the Office's reasoning in claims 1 and 2 to this claim. Claims 1 and 2 recite modeling software and operating on the software model using a random destination algorithm and at least one other different algorithm. This claim recites traversing a state graph. In fact, this claim does not even expressly recite a ***"random destination algorithm"***. Applicant respectfully submits that the Office has improperly expressed this rejection, as described by MPEP 707.07(d). MPEP 707.07(d) states, in pertinent part, that:

> **IMPROPERLY EXPRESSED REJECTIONS**
>
> An omnibus rejection of the claim "on the references and for the reasons of record" is stereotyped and usually not informative and should

> therefore be avoided. This is especially true where certain claims have been rejected on one ground and other claims on another ground. A plurality of claims ***should never be grouped together in a common rejection, unless that rejection is equally applicable to all claims in the group***.

Nevertheless, the cited portions of Kita do not disclose or suggest the features in this claim. Specifically, these portions do not disclose or suggest traversing a state graph, as claimed, or ***using an algorithm having a first graph traversal characteristic and using an algorithm having a second graph traversal characteristic that is different from the first graph traversal characteristic,*** as claimed.

Without a properly expressed rejection that is applicable to this claim which explains the Office's reasoning, proper notice of the rejection, as required (see 35 U.S.C. §132), has not been provided to the Applicant. Applicant submits that the Office has not established a *prima facie* case of obviousness and has made an improper rejection. Hence, for at least these reasons, this claim is allowable. If the Office disagrees, Applicant requests that the Office properly apply the reference and explain its reasoning for its rejection of this claim.

Claims 18-21 depend from claim 17 and are allowable as depending from an allowable base claim. These claims are also allowable for their own recited features which, in combination with those recited in claim 17, are neither disclosed nor suggested in the references of record, either singly or in combination with one another.

Claim 22 recites a method of testing software comprising:

- traversing a state graph ***using a deterministic first algorithm*** to produce a sequence of test actions, the state graph having multiple

nodes individual ones of which represent a state, and links between the nodes that represent actions; and

- traversing the state graph ***using a second algorithm that is less deterministic than the first algorithm*** to produce a further sequence of test actions.

In making out the rejection of this claim, the Office first argues that in Figure 2, Kita discloses "traversing a state graph using an algorithm to produce a sequence of test actions, the state graph having multiple nodes individual ones of which represent a state, and links between the nodes that represent actions." It then argues that "traversing the state graph using a second algorithm that is less deterministic than the first algorithm to produce a further sequence of test actions" is disclosed by Kita (column 3 lines 25-34 and column 19 line 25 to column 20 line 21). The Office acknowledges that Kita "does not explicitly disclose the algorithm is a deterministic first algorithm", but asserts that applicant admits (in pages 5-10 of the Application) that ***"various types of were well known in the art at the time the invention was made"***. The Office then reasons:

> Therefore, it would have been obvious to one having ordinary skill in the art to incorporate the well known knowledge into the teaching of Kita et al to have the algorithm to be a ***deterministic first algorithm because doing so provides an efficient method to test the software*** with various methods according to various requirement to evaluate the performance of the software thoroughly.

Applicant respectfully disagrees and submits that the Office has not established a *prima facie* case of obviousness.

Applicant agrees that Kita does not disclose a "deterministic first algorithm, and further asserts that the cited portions of Kita do not disclose deterministic

algorithms at all. Specifically, figure 2 is described in Kita at column 5 Lines 61-62 as "a state diagram of a simple example of an extended finite state machine (EFSM)." Applicant fails to see how this figure discloses "traversing a state graph using an algorithm to produce a sequence of test actions". Further, "traversing the state graph using a second algorithm that is less deterministic than the first algorithm to produce a further sequence of test actions" is not disclosed in the portions of Kita cited by the Office. The cited portions of column 3 describe automatically converting a program specification into an EFSM or a multiple-EFSM architecture, and automatically generating validation tests for implementations of that program specification. The validation tests are generated by ***traversing valid paths*** through the EFSM (or multiple-EFSM architecture) and coupling each such path with the source code of the implementation in a program shell. The cited portions of columns 19 to 20 describe traversing paths through the EFSM. This indicates that this traversal "may be accomplished by a conventional path generation method." Further, a reference is made to an exhaustive path generation method (all paths through the EFSM are traversed) or a constrained method (limited paths traversed). Applicant notes that there is no disclosure or suggestion in these cited portions concerning the use of a ***first deterministic algorithm and a second algorithm that is less deterministic than the first algorithm***, as claimed.

Following its questionable and seemingly erroneous determination that a second algorithm that is less deterministic than the first algorithm is disclosed, the Office addresses the admitted absence of any disclosure in Kita to a first deterministic algorithm. The Office reasons that "***various types of were well known*** in the art at the time the invention was made". This statement is

nonsensical because ***it does not indicate what the Office alleges was well known*** in the art. Therefore, the Office's subsequent reasoning that it would have been obvious "to incorporate the well known knowledge into the teaching of Kita" is indefinite because the "well known" knowledge alleged by the Office is never disclosed. Perhaps more importantly, even if the "well known" knowledge had been disclosed, the Office still would have failed to present a ***convincing line of reasoning*** by relying solely on the notion that incorporating knowledge would have been obvious ***because doing so provides an efficient method to test the software.*** As discussed above, this argument does not address ***why*** a specific proposed incorporation would have been obvious.

In view of the above discussion, the Office has not established a *prima facie* case of obviousness and has made an improper rejection. Hence, for at least these reasons, this claim is allowable.

Claim 23 recites a method of testing software comprising:

- traversing a state graph using a random walk first algorithm to produce a sequence of test actions, the state graph having multiple nodes individual ones of which represent a state, and links between the nodes that represent actions; and
- traversing the state graph ***using a second algorithm that is less random than the first algorithm*** to produce a further sequence of test actions.

In making out the rejection of this claim, the Office reiterates the exact language that is used for claim 22.

Applicant respectfully disagrees and submits that the Office has not established a *prima facie* case of obviousness. As discussed above, there is no disclosure or suggestion in these cited portions concerning the use of ***a second***

algorithm that is less random than the first algorithm, as claimed. In addition, for the same reasons as discussed above, the Office's argument does not address ***why*** a specific proposed incorporation would have been obvious.

In view of the above discussion, the Office has not established a *prima facie* case of obviousness and has made an improper rejection. Hence, for at least these reasons, this claim is allowable.

Claim 24 recites a method of testing software comprising:

- providing ***one or more algorithms*** for operating on a software model that describes behavior associated with software that is to be tested;
- selecting ***one or more algorithms***;
- operating on the software model ***using the selected one or more algorithms*** to produce a sequence of test actions;
- changing the selected ***one or more algorithms***; and
- operating on the software model using ***one or more changed algorithms.***

In making out the rejection of this claim, the Office relies on its reasoning regarding claim 1. Applicant respectfully disagrees and submits that the Office has not established a *prima facie* case of obviousness.

Applicant is confused in regards to the applicability of the Office's reasoning in claim 1 to this claim. Claim 1 recites a method for testing software comprising modeling software and operating on the software model using a random destination algorithm and at least one other different algorithm. This claim does not expressly mention a ***random destination algorithm***. Nevertheless, Applicant submits that the cited portions of Kita, in regards to claim 1, do not disclose or suggest the subject matter of this claim.

Without a properly expressed rejection that is applicable to this claim which explains the Office's reasoning, proper notice of rejection has not been provided to the Applicant. Nonetheless, Applicant has studied the reference and submits that the Office has not established a *prima facie* case of obviousness. Hence, for at least these reasons, this claim is allowable. If the Office disagrees, then Applicant respectfully requests that the Office properly explain its reasoning for its rejection of this claim.

Claims 25-27 depend from claim 24 and are allowable as depending from an allowable base claim. These claims are also allowable for their own recited features which, in combination with those recited in claim 24, are neither disclosed nor suggested in the references of record, either singly or in combination with one another.

Claim 28 recites one or more computer-readable media having computer-readable instructions thereon which, when executed by a computer, cause the computer to:

- provide ***one or more algorithms*** for operating on a software model that describes behavior associated with software that is to be tested;
- select ***multiple algorithms*** to define a ***first collection of algorithms***;
- operate on the software model using ***the first collection of algorithms*** to produce a sequence of test actions;
- ***change at least one of the selected algorithms to define a second collection of algorithms***; and
- operate on the software model using the ***second collection of algorithms*** to produce an additional sequence of test actions.

In making out the rejection of this claim, the Office relies on its reasoning regarding claim 24, which in turn relies on the reasoning in claim 1. Applicant

respectfully disagrees and submits that the Office has not established a *prima facie* case of obviousness.

Applicant is confused in regards to the applicability of the Office's reasoning in claim 1 to this claim. As discussed above, claim 1 recites a method for testing software comprising modeling software and operating on the software model using ***a random destination algorithm*** and at least one other different algorithm, as claimed. This claim does not expressly mention a ***random destination algorithm***. Nevertheless, Applicant submits that the cited portions of Kita, in regards to claim 1, do not disclose or suggest the subject matter of this claim.

Without a properly expressed rejection that is applicable to this claim which explains the Office's reasoning, proper notice of rejection has not been provided to the Applicant. Nonetheless, Applicant has studied the reference and submits that the Office has not established a *prima facie* case of obviousness. Hence, for at least these reasons, this claim is allowable. If the Office disagrees, then Applicant respectfully requests that the Office properly explain its reasoning for its rejection of this claim.

Claim 29 recites a method of testing software comprising:

- traversing a state graph using a ***random destination algorithm***, the state graph having multiple nodes individual ones of which representing a state, and links between the nodes that represent actions, said traversing producing a sequence of test actions; and
- traversing the state graph using ***multiple steps from a random walk algorithm*** to produce an additional sequence of test actions.

In making out the rejection of this claim, the Office relies on its reasoning regarding claims 9-11, which in turn relies on the reasoning in claims 1-2 and 11. Applicant respectfully disagrees and submits that the Office has not established a *prima facie* case of obviousness.

Applicant is confused in regards to the applicability of the Office's reasoning in claims 9-11 to this claim. Claims 9-11 recite modeling software, as claimed and operating on the software model, as discussed above. This claim recites ***traversing a state graph***, as claimed. Without a properly expressed rejection that is applicable to this claim and which explains the Office's reasoning, proper notice of rejection has not been provided to the Applicant. Therefore, Applicant requests that the Office properly explain its reasoning for its rejection of this claim.

Nevertheless, the cited portions of Kita do not disclose or suggest the features in this claim. The argument the Office makes in claim 11 is essentially the same argument it makes in claim 1, except it refers to specific algorithms. Neither argument is valid because Kita does not discuss operating on the software model using a ***random destination algorithm***, as claimed. Additionally, the cited portions of Kita do not teach or suggest operating on the software model using ***multiple steps from a random walk algorithm,*** as claimed. Furthermore, pages 5-10 of Applicant's application do not admit that a ***random destination algorithm*** was well known in the art, nor does the cited portion even mention ***random destination algorithm.*** As discussed above, it is irrelevant whether or not the Applicant admits in pages 5-10 of the application that certain algorithms were well known in the art. Regardless of the types of algorithms available, there is no

teaching or suggestion to traverse a state graph using a ***random destination algorithm*** or ***multiple steps from a random walk algorithm***, as claimed.

Further, for the same reasons as discussed above, the Office has failed to present a ***convincing line of reasoning*** as to why it would have been obvious to incorporate a random destination algorithm or multiple other algorithms into the teachings of Kita.

Applicant asserts that, based upon the information provided, the Office has not established a *prima facie* case of obviousness and has made an improper rejection. Hence, for at least these reasons, this claim is allowable.

Claims 30-36 depend from claim 29 and are allowable as depending from an allowable base claim. These claims are also allowable for their own recited features which, in combination with those recited in claim 29, are neither disclosed nor suggested in the references of record, either singly or in combination with one another.

Claim 37 recites a method of testing software comprising:

- selecting a ***first algorithm from among a number of different algorithms***;
- operating on a software model that describes behavior of software that is to be tested, said operating taking N steps ***using the first algorithm***, where N is an integer and said steps produce a sequence of test actions;
- selecting ***a second algorithm from among the number of different algorithms***, the ***second algorithm being different from the first algorithm***; and
- operating on the software model by taking N1 steps ***using the second algorithm***, where N1 is an integer, said N1 steps producing an additional sequence of test actions.

In making out the rejection of this claim, the Office relies on its reasoning regarding claim 28, which in turn relies on the reasoning in claim 24, which in turn relies on the reasoning in claim 1. Applicant respectfully disagrees and submits that the Office has not established a *prima facie* case of obviousness.

Applicant is confused in regards to the applicability of the Office's reasoning in claim 1 to this claim. As discussed above, claim 1 recites modeling software and operating on the software model using a random destination algorithm and at least one other different algorithm. This claim does not expressly mention ***a random destination algorithm***. Nevertheless, Applicant submits that the cited portions of Kita, in regards to claim 1, do not disclose or suggest the subject matter of this claim.

Without a properly expressed rejection that is applicable to this claim and which explains the Office's reasoning, Applicant has not received proper notice of rejection as required. Applicant requests that the Office properly explain its reasoning for its rejection of this claim. In addition, Applicant asserts that, based upon the information provided, the Office has not established a *prima facie* case of obviousness. Hence, for at least these reasons, this claim is allowable.

Claims 38-52 depend from claim 37 and are allowable as depending from an allowable base claim. These claims are also allowable for their own recited features which, in combination with those recited in claim 37, are neither disclosed nor suggested in the references of record, either singly or in combination with one another.

Claim 53 recites a method of testing software comprising:

- representing software using a model that describes the software's behavior, the software having ***an associated social context***; and

- selecting ***one or more algorithms*** to operate upon the model as a function of the software's ***social context***; and
- operating upon the model using the ***selected one or more algorithms*** to produce a sequence of test actions.

In making out the rejection of this claim, the Office first argues that in Figure 2, Kita discloses "representing software using a model that describes the software's behavior". It then argues "operating upon the model using the selected one or more algorithms to produce a sequence of test actions" is disclosed by Kita (citing column 3 lines 25-34 and column 19 line 25 to column 20 line 21). The Office acknowledges that Kita "does not explicitly disclose the software having an associated social context; and selecting one or more algorithms to operate upon the model as a function of the software's social context..." However, the Office takes ***Official Notice*** that "software having an associated social context; and selecting one or more algorithms to operate upon the model as a function of the software's social context ..." were well known in the art at the time the invention was made. The Office then reasons:

> Therefore, it would have been obvious to one having ordinary skill in the art to incorporate the well known knowledge to have the software having an associated social context; and selecting one or more algorithms to operate upon the model as a function of the software's social context and the social context to be associated with the software developer ***because doing so ensures the testing algorithm is selected appropriately for different software and provides an efficient method to test the software more accurately and more thoroughly.***

Applicant respectfully disagrees and submits that the Office has not established a *prima facie* case of obviousness. Applicant agrees that Kita does not explicitly disclose the software having an associated social context; and selecting

one or more algorithms to operate upon the model as a function of the software's social context. Applicant disagrees with the Office's obviousness rejection and reminds the Office that the prior art reference must teach or suggest ***all the claim limitations***. The cited portions of Kita do not disclose or suggest "representing software using a model that describes the software's behavior, the software having ***an associated social context***"; "selecting ***one or more algorithms*** to operate upon the model as a function of the software's ***social context***"; or "operating upon the model using the ***selected one or more algorithms*** to produce a sequence of test actions." Instead, the cited portions of Kita describe automatically converting a program specification into an EFSM or a multiple-EFSM architecture, and for automatically generating validation tests for implementations of that program specification. The validation tests are generated by traversing valid paths through the EFSM (or multiple-EFSM architecture) and coupling each such path with the source code of the implementation in a program shell.

In regards to "software having an associated social context" and "selecting one or more algorithms to operate upon the model as a function of the software's social context", the Office is taking Official Notice without the support of any evidence in the record. Applicant traverses any such assertion by the Office and requests that documentary evidence, pursuant to MPEP 2144.03(c) and 37 CFR 1.104(c)(2), be provided to support the Office's contention.

Further, the Office has failed to present a ***convincing line of reasoning*** explaining why it would have been obvious to incorporate "the well known knowledge to have the software having an associated social context" or "selecting one or more algorithms to operate upon the model as a function of the software's social context" into the teachings of Kita. As mentioned above, to support the

conclusion that the claimed invention is directed to obvious subject matter, either the references must expressly or impliedly suggest the claimed invention or the examiner must present a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references. In the present case, the Office's attempt at a ***convincing line of reasoning*** is to state simply that ***"because doing so ensures the testing algorithm is selected appropriately for different software and provides an efficient method to test the software more accurately and more thoroughly."*** As noted above, particular findings must be made as to the *reason* the skilled artisan, *with no knowledge of the claimed invention*, would have selected these components for combination in the manner claimed. Here, the Office simply recites advantages but ***does not address why*** this would have been obvious. Additionally, there is nothing in Kita that would suggest using software having an associated social context. The only teaching or suggestion to do this is found in Applicant's disclosure. Applicant respectfully reminds the Office that the teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in applicant's disclosure.

In view of the above discussion, the Office has not established a *prima facie* case of obviousness and has made an improper rejection. Hence, for at least these reasons, this claim is allowable.

Claims 54 and 55 depend from claim 53 and are allowable as depending from an allowable base claim. These claims are also allowable for their own recited features which, in combination with those recited in claim 53, are neither disclosed nor suggested in the references of record, either singly or in combination with one another.

Claim 56 recites a method of testing software comprising:

- developing a ***profile associated with one or more software developers***, the profile describing ***one or more algorithms*** that are more likely to identify problems ***associated with software developed by the one or more software developers;***
- selecting, ***from a developer's profile, one or more algorithms when a software model associated with the developer's software*** is to be operated upon; and
- operating upon the software model using the ***selected one or more algorithms*** to produce a sequence of test actions.

In making out the rejection of this claim, the Office relies on its reasoning regarding claims 53-55. Applicant respectfully disagrees and submits that the Office has not established a *prima facie* case of obviousness.

Applicant is confused in regards to the applicability of the Office's reasoning in claims 53-55 to this claim. As discussed above, claim 53 recites representing software using a model that describes the software's behavior, selecting one or more algorithms to operate upon the model as a function of the software's social context, and operating on the software model. Claims 54 and 55 depend upon claim 53. This claim, however, recites ***developing a profile*** associated with one or more software developers; selecting, ***from a developer's profile***, one or more algorithms; and operating upon the software model using the selected one or more algorithms. Nevertheless, Applicant submits that the cited portions of Kita, in regards to claims 53-55, do not disclose or suggest the subject matter of this claim.

Without a properly expressed rejection that is applicable to this claim which explains the Office's reasoning, proper notice of rejection has not been provided to the Applicant. Nonetheless, Applicant has studied the reference and submits that the Office has not established a *prima facie* case of obviousness. Hence, for at least these reasons, this claim is allowable. If the Office disagrees, then Applicant respectfully requests that the Office properly explain its reasoning for its rejection of this claim.

Claim 57 recites a method of testing software comprising:

- defining one or more clusters in a software model that models software that is to be tested;
- providing ***multiple different algorithms*** for operating upon the software model;
- selecting a first algorithm for operating on the software model to produce a sequence of test actions;
- ***selecting a second algorithm that is different from the first algorithm*** for operating on the software model to produce an additional sequence of test actions; and
- ***operating on the software model using the first and second algorithms*** to produce the sequences of test actions, ***one of the first and second algorithms having a better chance at accessing a cluster than the other of the first and second algorithms***.

In making out the rejection of this claim, the Office relies on its reasoning regarding claim 37, which in turn relies on the reasoning in claim 28, which in turn relies on the reasoning in claim 24, which in turn relies on the reasoning in claim 1. Applicant respectfully disagrees and submits that the Office has not established a *prima facie* case of obviousness.

Applicant is confused in regards to the applicability of the Office's reasoning in claim 1 to this claim. As discussed above, claim 1 recites modeling

software and operating on the software model using a random destination algorithm and at least one other different algorithm. In contrast, this claim recites defining one or more clusters in a software model, as claimed; providing multiple different algorithms, as claimed, selecting a first algorithm for operating on the software model, as claimed; selecting a second algorithm that is different from the first algorithm, as claimed, and operating on the software model, as claimed. In fact, this claim does not even expressly recite a ***"random destination algorithm"***.

Nevertheless, Applicant submits that the cited portions of Kita, in regards to claim 1, do not disclose or suggest the subject matter of this claim.

Without a properly expressed rejection that is applicable to this claim and which explains the Office's reasoning, Applicant has not received proper notice of rejection, as required. Nonetheless, Applicant submits that the Office has not established a *prima facie* case of obviousness. Hence, for at least these reasons, this claim is allowable. If the Office disagrees, Applicant requests that the Office properly apply the reference and explain its reasoning for its rejection of this claim.

Claims 58-65 depend from claim 57 and are allowable as depending from an allowable base claim. These claims are also allowable for their own recited features which, in combination with those recited in claim 57, are neither disclosed nor suggested in the references of record, either singly or in combination with one another.

Claim 66 recites a software-testing system comprising:

- a software model processor configured to:
  - receive a software model that describes behavior associated with software that is to be tested, and

- operate upon the model to provide a sequence of test commands for testing the software; and
- ***an algorithm set*** associated with the model processor and comprising ***multiple different algorithms***, the software model processor being configured to ***select at least two different algorithms and use the algorithms to operate upon the software model*** to produce the sequence of test commands.

In making out the rejection of this claim, the Office relies on its reasoning regarding claim 28, which in turn relies on the reasoning in claim 24, which in turn relies on the reasoning in claim 1. Applicant respectfully disagrees and submits that the Office has not established a *prima facie* case of obviousness.

Applicant is confused in regards to the applicability of the Office's reasoning in claim 1 to this claim. As discussed above, claim 1 recites modeling software and operating on the software model using a random destination algorithm and at least one other different algorithm. In contrast, this claim includes recitation to "an algorithm set associated with the model processor and comprising multiple different algorithms, the software model processor being configured to select at least two different algorithms and use the algorithms to operate upon the software model to produce the sequence of test commands." In fact, this claim does not even expressly recite a ***"random destination algorithm".***

Nevertheless, Applicant submits that the cited portions of Kita, in regards to claim 1, do not disclose or suggest the subject matter of this claim.

Without a properly expressed rejection that is applicable to this claim and which explains the Office's reasoning, Applicant has not received proper notice of rejection, as required. Nonetheless, Applicant submits that the Office has not established a *prima facie* case of obviousness. Hence, for at least these reasons, this claim is allowable. If the Office disagrees, Applicant requests that the Office

properly apply the reference and explain its reasoning for its rejection of this claim.

Claims 67-72 depend from claim 66 and are allowable as depending from an allowable base claim. These claims are also allowable for their own recited features which, in combination with those recited in claim 66, are neither disclosed nor suggested in the references of record, either singly or in combination with one another.

Claim 73 recites a software-testing system comprising:

- a software model processor configured to:
  - receive a software model in the form of a state graph that describes behavior associated with software, the state graph having multiple nodes that represent state, and links between the nodes that represent actions, and
  - traverse the state graph to provide a sequence of commands for testing the software;
- an algorithm set associated with the model processor and comprising ***multiple different algorithms***; and
- a graph traverser associated with the model processor and configured to:
  - traverse the state graph using an algorithm from the ***algorithm set***, the ***algorithm having a first graph traversal characteristic*** to produce a sequence of test commands, and
  - traverse graph with an algorithm from ***the algorithm set having a second graph traversal characteristic that is different from the first graph traversal characteristic*** to produce a further sequence of test commands.

In making out the rejection of this claim, the Office relies on its reasoning regarding claims 57-59, which in turn relies on the reasoning in claims 2, 17, and 37, which ultimately relies on the reasoning in claims 1-2. Applicant respectfully

disagrees and submits that the Office has not established a *prima facie* case of obviousness.

Applicant is confused in regards to the applicability of the Office's reasoning in claims 1 and 2 to this claim. As discussed above, claims 1 and 2 recite modeling software and operating on the software model using a random destination algorithm and at least one other different algorithm, as claimed. In contrast, this claim includes recitation to "an algorithm set associated with the model processor and comprising multiple different algorithms" and a "graph traverser associated with the model processor" configured to: "traverse the state graph using an algorithm from the algorithm set, the algorithm having a first graph traversal characteristic", as claimed and "traverse graph with an algorithm from the algorithm set having a second graph traversal characteristic, as claimed. In fact, this claim does not even expressly recite a ***"random destination algorithm"***.

Nevertheless, Applicant submits that the cited portions of Kita, in regards to claim 1, do not disclose or suggest the subject matter of this claim.

Without a properly expressed rejection that is applicable to this claim and which explains the Office's reasoning, Applicant has not received proper notice of rejection, as required. Nonetheless, Applicant submits that the Office has not established a *prima facie* case of obviousness. Hence, for at least these reasons, this claim is allowable. If the Office disagrees, Applicant requests that the Office properly apply the reference and explain its reasoning for its rejection of this claim.

Claims 74 and 75 depend from claim 73 and are allowable as depending from an allowable base claim. These claims are also allowable for their own recited features which, in combination with those recited in claim 73, are neither

disclosed nor suggested in the references of record, either singly or in combination with one another.

Claim 76 recites a software-testing system comprising:

- means for receiving a software model;
- means for operating on the software model in a first manner to produce a sequence of test actions; and
- means for operating on the software model in ***different additional manners*** to produce additional sequences of test actions.

In making out the rejection of this claim, the Office relies on its reasoning regarding claim 17, which in turn relies on the reasoning in claims 1 and 2. Applicant respectfully disagrees and submits that the Office has not established a *prima facie* case of obviousness

Applicant is confused in regards to the applicability of the Office's reasoning in claims 1 and 2 to this claim. Nevertheless, Applicant submits that the cited portions of Kita, in regards to claim 1, do not disclose or suggest a means for "operating on the software model in a first manner to produce a sequence of test actions" or "for operating on the software model in different additional manners to produce additional sequences of test actions."

Without a properly expressed rejection that is applicable to this claim and which explains the Office's reasoning, Applicant has not received proper notice of rejection, as required. Nonetheless, Applicant submits that the Office has not established a *prima facie* case of obviousness. Hence, for at least these reasons, this claim is allowable. If the Office disagrees, Applicant requests that the Office properly apply the reference and explain its reasoning for its rejection of this claim.

Claim 77 depends from claim 76 and is allowable as depending from an allowable base claim. This claim is also allowable for its own recited features which, in combination with those recited in claim 76, are neither disclosed nor suggested in the references of record, either singly or in combination with one another.

Claim 78 recites a method of modeling user behavior comprising:

- representing software using a model comprising a state graph, the state graph having multiple nodes individual ones of which represent a state, and links between the nodes that represent actions;
- traversing the state graph using an ***algorithm having a first graph traversal characteristic*** to produce a sequence of user actions; and
- traversing the state graph using an algorithm having a ***second graph traversal characteristic that is different from the first graph traversal characteristic*** to produce a further sequence of user actions.

In making out the rejection of this claim, the Office relies on its reasoning regarding claim 17-18, which in turn relies on the reasoning in claims 1and 2. Applicant respectfully disagrees and submits that the Office has not established a *prima facie* case of obviousness

Applicant is confused in regards to the applicability of the Office's reasoning in claims 1 and 2 to this claim. Claims 1 and 2 recite modeling software and operating on the software model using a random destination algorithm and at least one other different algorithm, as claimed. This claim recites representing software, as claimed, and traversing a state graph, as claimed. In fact, this claim does not even expressly recite a ***"random destination algorithm"***.

Nevertheless, the cited portions of Kita do not disclose or suggest the features in this claim. Specifically, these portions do not disclose or suggest traversing a state graph, as directed in this claim, by traversing the state graph using an ***algorithm having a first graph traversal characteristic*** to produce a sequence of user actions; and traversing the state graph using an algorithm having a ***second graph traversal characteristic that is different from the first graph traversal characteristic*** to produce a further sequence of user actions.

Without a properly expressed rejection that is applicable to this claim and which explains the Office's reasoning, Applicant has not received proper notice of rejection, as required. Nonetheless, Applicant submits that the Office has not established a *prima facie* case of obviousness. Hence, for at least these reasons, this claim is allowable. If the Office disagrees, Applicant requests that the Office properly apply the reference and explain its reasoning for its rejection of this claim.

Conclusion

All of the claims are in condition for allowance. Accordingly, Applicant requests a Notice of Allowability be issued forthwith. If the Office's next anticipated action is to be anything other than issuance of a Notice of Allowability, Applicant respectfully requests a telephone call for the purpose of scheduling an interview.

Respectfully Submitted,

Dated: 10/4/04

By: _____

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